

SUCCESS STORIES

CH-47F CHINOOK CARGO HELICOPTER

ENVIRONMENTAL QUALITY LIFE-CYCLE COST ESTIMATE



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The Environmental Quality Life-Cycle Cost Estimate (EQLCCE) for the CH-47F Chinook Cargo Helicopter, completed in August 2000, represents the Army's continuing effort to identify and quantify environmental quality costs over the entire life-cycle for this weapon system. The EQLCCE was prepared in accordance with the U.S. Army Cost and Economic Analysis Center's (CEAC's) *Cost Analysis Manual*, July 1997. The EQLCCE information can be used to identify areas of improvement such as material substitution, process changes and/or recycling, and potentially reduce the overall cost of the weapon system. An environmental Work Breakdown Structure (WBS) format was used to compile individual environmental quality cost elements and total costs for the entire CH-47F program. The WBS includes all weapon system cost elements associated with environmental and regulatory compliance.

BENEFITS

The significant benefits of performing an EQLCCE for a weapon system are:

- ◆ Improving visibility of proven and potential environmental impacts and costs of the weapon system
- ◆ Providing opportunities for the Program Manager (PM), developer and fielding installations to identify and reduce environmental quality costs and determine alternative decisions associated with the weapon system
- ◆ Reducing the potential risk of remediation/restoration of environmental impacts with potential cost savings to the Army
- ◆ Providing an independent cost estimate acceptable to CEAC for validation
- ◆ Assisting the PM in defining compliance issues with federal environmental regulations and DoD acquisition requirements.

The EQLCCE for the CH-47F program identified \$125M (\$FY00) in environmental quality costs. Of this total, \$92.6M were previously identified in the Army Cost Position. As a result of conducting the EQLCCE, an additional \$32.4M of environmental quality costs were identified. By integrating these costs into the weapon system Program Office Estimate, the PM was able to plan for and better manage environmental risk.



The CH-47F program management team indicated that the EQLCCE also provided the following benefits:

- ◆ Identification of hazardous material and waste disposal costs at the installation level
- ◆ Identification of cost data that can be used to support funding proposal development; update Pollution Prevention, Environmental Management, and Hazardous Material Management Plans; and prepare National Environmental Policy Act documentation
- ◆ Identification of several topics for discussion related to environmental improvements such as:
 - o incorporation of a fuel recovery system during engine shutdown
 - o reduced environmental impacts and cost as a result of implementing a Low Maintenance Rotor Hub.

BACKGROUND

The CH-47 Chinook Cargo Helicopter is the Army's heavy-lift battlefield workhorse with over 35 years in the field. The CH-47 can fly at airspeeds up to 159 knots at a gross weight up to 50,000 pounds. Its ability to carry loads up to 26,000 pounds makes it a force multiplier, moving troops, cargo and munitions to support battlefield operations around the world. More than 480 Chinook aircraft serve today's Army.

In response to the 1995 Defense Appropriations Act requirements, the DoD was tasked to develop methodologies and databases for the analysis of environmental quality costs of major defense acquisitions/programs. Responsibility for performing environmental quality costs analysis of Major Defense Acquisition Programs in the Army is borne by the responsible Program Manager's Office, CEAC and various DoD agencies. PMs who acquire, fund, produce and maintain weapon systems must, in accordance with DoD 5000.2-R, determine environmental quality costs and impacts of weapon systems from conception through disposal.

Due to rising concerns about hidden environmental quality costs associated with Army weapon systems, a number of studies, including audits performed by the DoD Inspector General and the Army Audit Agency, have examined the Environmental, Safety and Health aspects of weapon systems acquisition. An Office of the Assistant Secretary of the Army (OASA) for Installations, Logistics and Environment briefing to OASA Research, Development and Acquisition on 9 September 1997 stated that over 75 percent of all Army pollution is caused directly or indirectly by weapon systems. Approximately 1.8 percent of the Army's Total Obligation Authority is spent annually on restoration, conservation,

compliance, and pollution prevention. Consequently, every effort should be made to reduce the various costs when possible.

EQLCCE HANDBOOK

The U.S. Army Environmental Center (USAEC) Acquisition Support Team is working with CEAC and PMs to develop and verify environmental quality life-cycle costs for various Army weapon systems. The team is developing methodology to calculate these costs. The information will be compiled in an EQLCCE handbook for materiel acquisition. The handbook will provide guidance for applying the methodology and for conducting an EQLCCE. The handbook will also serve as a guide for PMs to estimate their program's environmental quality life-cycle costs.

In addition to the CH-47F Chinook, USAEC has completed EQLCCEs for the RAH-66 Comanche and AH-64D Apache helicopter programs and the M2A3/M3A3 Bradley Fighting Vehicle System. The results from these EQLCCEs will be incorporated into the EQLCCE handbook.

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